

REMARKS

Favorable consideration of this application is respectfully requested.

Claims 3-8, 10-12, 14-17, 19-22, 24-26, 28-31, and 33-48 are currently active in this case. Claims 4, 5, 15, 29, 33, 37-42 and 47 have been amended by way of the present amendment. Each amended claim is supported by the specification and claims as originally submitted and no new matter has been added.

In the outstanding Official Action, the Drawings and Claim 33 were objected to; Claims 3-8, 15, 16, 29, and 30 were rejected under 35 U.S.C. §112, first paragraph, as containing subject matter not described in the specification; Claims 3-8, 15, 16, 29, and 30 were rejected under 35 U.S.C. §112, second paragraph, as being indefinite; Claims 3-5, 7, and 8 were rejected under 35 U.S.C. §103(a) over *Roychowdhury* (U.S. Patent No. 5,995,733) in view of *Fabien* ("Indirect numerical solution of constrained optimal control problems with parameters", IEEE 1995); and further in view of *Srinivasan et al.* ("A multi-criteria approach to dynamic optimization", IEEE 995, hereinafter *Srinivasan*) and *Yang et al.* ("A pseudospectral method for time-domain computation of electromagnetic scattering by bodies of revolution", IEEE 1999, hereinafter *Yang*); Claim 6 is rejected under 35 U.S.C. §103(a) over *Roychowdhury* in view of *Fabien* and further in view of *Srinivasan*, *Yang*, and *Pasic* ("An algorithm for numerical solution of differential-algebraic equations", IEEE 1997); Claim 37 is rejected under 35 U.S.C. §103(a) over *Roychowdhury* in view of *Yang*; and Claim 43 was rejected under 35 U.S.C. §103(a) over *Roychowdhury* in view of *Yang* and further in view of *Fabien*.

Applicants appreciatively acknowledge the Examiner's allowance of Claims 10-12, 14, 17, 19-22, 24-26, 28, 31, 33, 35, 36, and 44-48 and the identification of allowable subject matter in Claims 38-42 .

Applicants appreciatively acknowledge the courtesy of short informal interview granted by Examiner Kandasamy during which the combination of 4 and 5 highly technically references was briefly discussed. The Examiner indicated that 5 references was probably too many, but requested that Applicants provide a formal interview request, and that Applicants specifically request that the Examiner discuss the same with his supervising Examiner. Accordingly, Applicants respectfully submit herewith a formal interview request and respectfully request that the Examiner discuss the combination of references with his supervisor.

Applicants respectfully traverse the rejection of Claims 3-8, 15-16, and 29-30 under 35 USC 112, first paragraph.

As to "defining a differential-algebraic equation of the circuit," as stated in Claims 3 and 5, Applicants respectfully note that the quoted step finds adequate support throughout Applicants specification. For Example, Page 10, lines 3-4, notes: *"Circuit behavior is usually described by a set of N nonlinear differential-algebraic equations (DAEs),"* which clearly describes DAEs that, when defined, represent a circuit. That the specification notes a more complicated multiple DAEs or complex circuits, does not detract from the teaching from which *"defining a differential-algebraic equation of the circuit"* is clearly supported as required under 35 USC 112, 1st paragraph.

Further, Applicants have amended the specification to specifically reference "defining a differential-algebraic equation of the circuit," which has been included at page 31, lines 21-22. Applicants respectfully note that the added language is

supported by the specification and claims as originally submitted and no new matter has been added.

Regarding Claims 15 and 29, and the first and last intervals noted therein. Applicants have amended Claims 15 and 29, not to further limit the claims, but to clarify the existence of multiple intervals, including a first and last interval. Applicants respectfully note that such clarification is inherent in the claim as originally submitted.

Applicants respectfully traverse the rejections of Claims 3-8, 15-16, and 29-30 under 35 USC 112, 2nd paragraph as being indefinite. Applicants respectfully note that the variables IM , $\sim uk$ and $Tk(t)$ are within standard nomenclature used in the industry and are specifically defined in Applicants specification. However, for the purposes of clarification (and not to further limit the claims), short references have been provided in each of Claims 4 and 5 for the variables in question. Accordingly, Applicants respectfully request that the rejections under 35 USC 112, 2nd paragraph pertaining to Claims 3-8 be withdrawn.

As noted above with respect to the 35 USC 112, 1st paragraph rejections, the intervals of Claims 15 and 29 have also been clarified. Accordingly, Applicants respectfully request that the rejections under 35 USC 112, 2nd paragraph pertaining to Claims 15 and 29 also be withdrawn.

Applicants respectfully traverse the rejection of Claims 4 and 5 under the combination of (1) *Roychowdhury*, (2) *Fabien*, (3) *Srinivassan*, and (4) *Yang*.

As a preliminary matter, Applicants respectfully re-assert that a combination of 4 highly technical references, each of which are directed to solve different problems within the DAE and/or circuit simulation space is an

improper combination. Even if the combined references contain each limitation as claimed, the whole of the 4 separate references fail to teach or fairly suggest the invention as claimed. Most crucial to such a determination of teaching the claimed invention is how the ordinarily skilled practitioner would know to identify the 4 different pieces of the references and then combine them *as claimed*. In fact, without a specification or direct instructions to do so, nothing together in the references themselves suggests the combination.

More importantly, the outstanding Office Action relies on the result obtained by the combination as motivation to combine certain of the references, but the references themselves lack any directions or suggestion to make that combination. In other combinations, techniques that specifically lack qualities provided by the present invention have their teachings dissected and then placed out of context to purportedly teach a limitation in the claimed invention.

Both can be illustrated, for example, as per Claim 4 where the combination of *Roychowdhury* and *Fabien* is supported in a statement asserting that *"The artisan would have been motivated because that would allow numerical solution of boundary value differential algebraic equations using shooting methods."* However, at page 5, Applicants provide detailed relevant discussion as to why shooting methods are not appropriate for a final solution according to the present invention. Accordingly, Applicants respectfully traverse any statement that would indicate a combination of a shooting method to the present invention as motivation to combine any portion of a shooting method with other aspects of the present invention unless a specific suggestion to do so can be cited. That *Fabien* teaches a numerical method is not enough because *Fabien's* shooting methods are not the same as other aspects of the present invention and, in fact, are not consistent with the accuracy and stability required in circuit simulations (Applicants specification, page 5, lines 4-21). Accordingly, Applicants respectfully request that the rejections of Claims 4 and 5 be withdrawn.

Applicants further respectfully traverse the rejection of Claim 6, under 35 USC 103 using the combination of (1) *Roychowdhury*, (2) *Fabien*, (3) *Srinivassan*, (4) *Yang*, and (5) *Pasic*. As noted above the combination of 4 highly technical references is itself an unlikely combination absent the roadmap provided by the claimed invention. As to Claim 6, the inclusion of the *Pasic* reference means that 5 highly technical references are now combined. However, the combination in no way represents a cohesive or integrated solution in that simply having the 5 references alone does not teach the claimed invention. Further, each reference combination relies on motivation that is not clearly defined within the references themselves. In fact, the only way to combine the references in a manner consistent with the present invention is to identify the building blocks of the claimed invention, find the same building blocks in other references, disjointedly pull the building blocks out of context from their references, and then apply them together as claimed in Applicant's claims. However, such a procedure is entirely hindsight using the claimed invention as a roadmap to place the disjointed pieces together. Even accepting the motivational statements for individual ones of the combinations presented in the outstanding Office Action, the sum total of pulling all such references together is still beyond what would be expected of the ordinary artisan.

Therefore, Applicants respectfully submit that the rejections based on combinations of 4 or 5 different highly technical (if not theoretical) references, and particularly the rejections based on Claim 6, be withdrawn. Accordingly, Applicants respectfully submit that independent Claims 4, 5, and dependent Claim 6 are patentable over the cited references..

Applicants respectfully traverse the rejection of Claim 37 over a combination of *Roychowdhury* and *Yang*. As amended, Claim 37 recites:

**37. (Currently Amended) A method of simulating
an rf circuit, comprising the steps of:
determining a ~~plurality~~ plurality of differential
equations describing operation of the rf circuit;**

determining a set of Chebyshev Gauss-Lobatto collocation points for the plurality of differential equations, producing a set of intervals;

discretizing each of the differential equations based on the Chebyshev Gauss-Lobatto collocation point intervals;

determining a smoothness for each interval,
increasing an order of a solution for an interval if it is smooth, and splitting the interval into at least two sub-intervals if the interval is not smooth;

solving the differential equations in each of the intervals; and

simulating the rf circuit based on the solved intervals.

However, the cited references fail to teach or suggest similar subject matter. In particular, Applicants respectfully note the smoothness determination for each interval which results in either an increased order of a solution for the interval or the splitting of the interval based on smoothness, neither taught or suggested by the cited references. Therefore, Applicants respectfully submit that Claim 37 is patentable over the cited references.

Further, Applicants respectfully note that each of Claims 38-42 were objected to as being dependent on a rejected base claim, but would be allowable if re-written in independent form. Claims 38 and 41 have been amended herein to be in independent form. Therefore, Applicants respectfully submit that Claims 38 and 41 are now patentable.

Based on the patentability of independent Claims 4, 5, 19, 20, 33, 34, 37, 38, 41, and 44, Applicants respectfully submit that dependent Claims 3, 6-8, 10-12, 14-17, 21, 22, 24-26, 28-31, 35, 36, 38-43, and 45-48 are also patentable.

Consequently, no further issues are believed to be outstanding, and it is respectfully submitted that this case is in condition for allowance. An early and favorable action is respectfully requested.

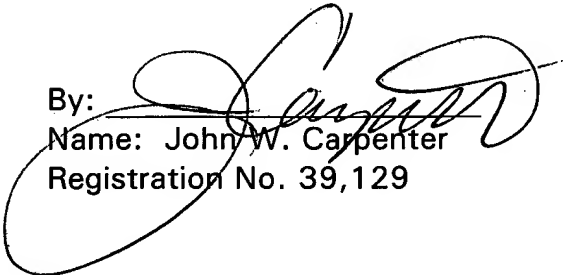
Respectfully submitted,
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